

Dissolved Gas Exposure of Adult Spring and Summer Chinook Salmon Migrating through Columbia and Snake River Reservoirs

Eric Johnson*, Dr. David H. Bennett, Dr. Theodore C. Bjornn, Dr. Christopher A. Peery,
Tami Reischel

Idaho Cooperative Fish and Wildlife Research Unit, U.S. Geological Survey

University of Idaho, Moscow, Idaho 83844-1141

john1646@uidaho.edu

(208) 885-7614

Abstract

We have evaluated the swimming depth of 130 of the 228 adult spring/summer chinook tagged with RDSTs to determine the extent of exposure to various dissolved gas conditions experienced during 2000. Dissolved gas supersaturation in the Columbia and Snake rivers routinely occurs during the spring and summer freshet when water spilling over hydroelectric dams entrains large volumes of air. Dissolved gas plumes extend downstream of dam spillways and create gas supersaturated conditions in reservoirs. During the spring and summer 2000, adult chinook salmon *Oncorhynchus tshawytscha* were tagged at Bonneville Dam with archival radio data storage transmitters (RDSTs) that recorded depth of migration every 5 seconds and the water temperature every 1 minute. Fish with RDSTs were used to determine in situ swimming depths in relation to water with higher dissolved gas concentrations as they migrated from the Bonneville Dam tailrace upstream to Lower Granite Dam.

Adult spring and summer chinook salmon spent a majority of the time at depths greater than 2 m during migration with the duration of time spent less than 2 m commonly being only several minutes. Because of the depth the adult salmon primarily migrated at, and corresponding compensation with pressure, effects from exposure to elevated levels of dissolved gas should have been minimal in 2000.